



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,216	09/01/2005	Ping Wang	089498-0436	7310
39905	7590	07/13/2009		
ROETZEL AND ANDRESS 222 SOUTH MAIN STREET AKRON, OH 44308			EXAMINER KAM, CHIH MIN	
			ART UNIT	PAPER NUMBER
			1656	
			MAIL DATE	DELIVERY MODE
			07/13/2009	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/519,216	<b>Applicant(s)</b> WANG ET AL.	
	<b>Examiner</b> CHIH-MIN KAM	<b>Art Unit</b> 1656	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 April 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 4-19 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 6-9 and 11-17 is/are allowed.
- 6) ☒ Claim(s) 4, 5, 10, 18 and 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

Art Unit: 1656

## **DETAILED ACTION**

### ***Status of the Claims***

1. Claims 1 and 4-19 are pending.

Applicants' amendments filed April 16, 2009 is acknowledged. Applicants' response has been fully considered. Claims 4, 10, 18 and 19 have been amended. Therefore, claims 1 and 4-19 are examined.

### **Withdrawn Claim Rejections - 35 USC § 102**

2. The previous rejection of claims 10, 18 and 19 under 35 U.S.C. 102(b) as being anticipated by Iyer *et al.* (Abstracts of Papers, 221<sup>st</sup> ACS national meeting, San Diego, CA, United States, April 1-5, 2001, ANYL-035), is withdrawn in view of applicants' amendment to the claim, and applicants' response at page 8 in the amendment filed April 16, 2009.

### ***Claim Rejections - 35 USC § 102/103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 4, 5, 10, 18, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by, or 35 U.S.C. 103(a) as being unpatentable over Tennent et al (US 6,099,960, issued 8 Aug 2000).

Art Unit: 1656

Tennent *et al.* teach a nanofiber comprising carbon, where the continuous carbon fiber are made by pyrolysis of organic precursor fibers usually rayon, polyacrylonitrile (PAN) and pitch, and the graphenic nature of continuous carbon fibers may be subjected to a subsequent graphenation step (column 6, lines 27-37). This carbon nanofiber is functionalized on the surface carbon of a nanofiber (i.e.,  $[C_nH_L)-A_m]$ ) so that it may immobilize active groups such as enzymes, antibodies, or antigens (see col. 10, lines 16-41, for example). Since the carbon nanofiber is made by pyrolysis of synthetic polymers such as rayon or PAN, the teachings of Tennent *et al.* are deemed to anticipate instant claims 4, 5, 18, and 19. Since any enzyme can be immobilized on the surface of carbon nanofibers, it would have been obvious to one of ordinary skill in the art that an enzyme such as trypsin, chymotrypsin or subtilisin can be attached to the surface of carbon nanofibers, which results in the claimed invention (claim 10) and was, as a whole, prima facie obvious at the time the claimed invention was made.

Response to Arguments

Applicants indicate Tennent *et al.* fails to disclose each and every element of claims 4, 18 and 19. Specifically, Tennent *et al.* fails to disclose, teach or suggest a fibrous protein-immobilization system composition that utilizes a fiber-forming material selected from the group consisting of nylons, polyesters, polyurethanes, silanes, synthetic polymers, or copolymers thereof. Since Tennent *et al.* does not disclose, teach or suggest each and every element of claims 4, 18 and 19, Tennent *et al.* cannot anticipate, or render obvious, claims 4, 5, 18 and 19. Therefore, the rejection under 35 U.S.C. 102(b) should be withdrawn (pages 7-8 of the response).

Art Unit: 1656

Applicants' response has been fully considered, however, the arguments are not found persuasive because Tennent *et al.* disclose the continuous carbon fiber are made by pyrolysis of organic precursor fibers such as rayon and polyacrylonitrile (PAN; column 6, lines 27-37), which are synthetic polymers. Thus, the teachings of Tennent *et al.* are deemed to anticipate instant claims 4, 5, 18, and 19. Therefore, the rejection of claims 4, 5, 18 and 19 is maintained.

### ***Conclusions***

4. Claims 4, 5, 10, 18 and 19 are rejected; and it appears that claims 1, 6-9 and 11-17 are free of art.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Min Kam whose telephone number is (571) 272-0948. The examiner can normally be reached on 8.00-4:30, Mon-Fri.

Art Unit: 1656

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached at 571-272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Chih-Min Kam/

Primary Examiner, Art Unit 1656

CMK

July 9, 2009